

Markets for Markets: Origins and Subjects of Information Markets

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I. INTRODUCTION

After the death of Pope John Paul II, a papal conclave convened to elect his successor. The media speculated that certain candidates were the “frontrunners” to watch.¹ At the same time, pools formed on websites to predict the outcome of the conclave, either for fun (using virtual money) or for profit (on gambling websites).² Throughout the days that the conclave met in April of 2005, trading continued, and

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¹ John Tierney, *Calling the Conclave*, N.Y. TIMES, April 13, 2005 at 9 (discussing favorites in the media and claiming that the online speculating would soon overtake media pundits in predicting future events).

² Stephanie McCrummen, *Pope Pick Fair Game for Gamblers Internet Bettors Wager on New Pontiff, Name He'll Use*, WASH. POST, April 5, 2005 at B1 available at <http://www.washingtonpost.com/wp-dyn/articles/A26353-2005April4.html>.

ultimately the various betting markets predicted that Cardinal Joseph Ratzinger would emerge as the next pope³ and that he would choose the name Benedict XVI.⁴ After the white smoke signifying a new pope had cleared, the online traders had accurately predicted the outcome of the conclave when the new Pope, the former Cardinal Ratzinger, emerged to give his first official speech from the Vatican balcony.⁵

Similar betting pools cropped up around the trial of celebrity Michael Jackson. After years of bizarre behavior, in 2005 the pop singer was tried on various child molestation charges.⁶ During the course of the trial, several online markets emerged to take bets on the outcome. The public had always expressed an intense interest in

³ Matt Crenson, *Bettors Gambling on Germany's Cardinal Ratzinger*, GUELPH MERCURY, April 16, 2005 (“among those speculating about who the next pope will be, the big money – literally – is on Joseph Ratzinger, who delivered a stirring homily at the late Pope’s funeral... As of yesterday, most gambling sites gave Ratzinger . . . the best odds, with a host of second-tier candidates not far behind.”); *Gamblers Betting on German*, TORONTO SUN, April 18, 2005, at 6; see also www.popebetting.com (website on pope bets that is part of Paddy Power, www.paddypower.com, the Irish gaming website) (beginning with odds of 12/1 on Cardinal Ratzinger, then reducing his odds to make him the favorite at 3/1, with competition from Francis Arinze of Nigeria and two Italian candidates); Jeffrey Fleishman, *Who the Next Pope Will Be is Up For Speculation*, L.A. TIMES, April 13, 2005 (quoting British gambling service William Hill as stating that Cardinal Arinze was the favorite, with Archbishop Tettamanzi, Cardinal Ratzinger and Cardinal Hummes as others to watch); *Bookies Like Ratzinger*, TORONTO SUN TIMES, April 16, 2005 (quoting British gambling service William Hill as stating that they were slashing the odds on Cardinal Ratzinger, making him the favorite).

⁴ Frank Delaney, *Holy Rollers and Papal Perfectas*, N.Y. TIMES, April 18, 2005, at A19 (listing Benedict as the favorite); Tom Heneghan, *New Pope's First Message 'A Name is a Sign,'* YAHOO NEWS, April 14, 2005 available at http://story.news.yahoo.com/news?tmpl=story&u=/nm/20050414/ts_nm/pope_names_dc (same).

⁵ Stephen Evans, *Futures Market Right on New Pope*, BBC NEWS, April 19, 2005, available at <http://news.bbc.co.uk/1/hi/business/4457715.stm>.

⁶ Kalefa Sannah, *The Whispering Pop Star Who's So Hard to Love and So Hard to Hate*, N.Y. TIMES, June 15, 2005 at E1.

Jackson's personal life, and the latest controversy provoked further speculation. Although trading shifted during the presentation of evidence by the prosecution, ultimately the market strongly favored an outcome in favor of Jackson's acquittal.⁷ When the verdict was read by the jury, Jackson had been acquitted of all charges.⁸

With both the papal conclave and Michael Jackson verdict, the various betting pools attracted a large number of participants and ultimately predicted the outcomes accurately. In both instances, these betting pools acted as information markets, also known as "prediction markets" and "idea futures."⁹ As we have written elsewhere,¹⁰ information markets are an emerging economic field in which individuals are provided incentives to trade on their knowledge and in the process produce predictions.¹¹ The

⁷ *Smart Money on Acquittal in Jackson Case: Online Betting Sites Offering Odds on Outcome of Trial*, MSNBC, May 24, 2005 available at <http://msnbc.msn.com/id/7965657>.

⁸ Jonathan D. Glater, *Weighing Celebrity Justice: Blind or Biased?*, N.Y. TIMES, June 15, 2005 at A14; Michael J. Lewis, *Pleasure Domes for Millionaires and Other Lost Boys*, N.Y. TIMES, June 19, 2005 at 9.

⁹ Information markets are also known in the economic literature as "prediction markets," "artificial markets," or "idea futures." Robin Hanson, *Impolite Innovation: The Technology and Politics of "Terrorism Futures" and other Decision Markets* 5 (Nov. 16 2004) (on file with authors and at <http://hanson.gmu.edu/impolite.pdf>) [hereinafter Hanson, *Impolite Innovation*].

¹⁰ Miriam A. Cherry & Robert L. Rogers, *Tiresias and the Justices: Using Information Markets to Predict Supreme Court Decisions*, 100 NW. U. L. REV. ___ (forthcoming 2006).

¹¹ Robin Hanson, *Impolite Innovation*, *supra* note [] at 5-6 ("Orange Juice futures improve on National Weather Service forecasts, horse race markets beat horse race experts, Oscar markets beat columnist forecasts, gas demand markets beat gas demand experts, stock markets beat the official NASA panel at fingering the guilty company in the Challenger accident, election markets beat national opinion polls, and corporate sales markets beat official corporate forecasts.")

economic literature has defined an information market as a setting where “participants trade in contracts whose payoff depends on unknown future events.”¹² The point of a particular information market, however, is not to provide financial or reputational incentives to the participants or to raise capital.¹³ Rather, the organizers structure the market to gather information that will aid in determining the outcome of a future event.¹⁴

¹² Justin Wolfers & Eric Zitzewitz, *Prediction Markets 2* (AEI-Brookings Joint Ctr. for Regulatory Studies 2004), available at <http://www.aei-brookings.org/admin/authorpdfs/page.php?id=1027>. This article was also published in *The Journal of Economic Perspectives*, volume 18, number 2. Note that the term “information market” has had a wide variety of meanings among various legal commentators. Until recently, this term was used in legal settings to denote a number of different concepts. The term was used to describe new types of financial opportunities that the advent of the internet created. See e.g. Ruth L. Okediji, *Trading Posts in Cyberspace: Information Markets and the Construction of Proprietary Rights*, 44 B. C. L. REV. 545, 547 (2003). The term has also been used to describe the practices of companies that collect information about individuals surfing the internet and then resell that information. See, e.g., Paul M. Schwartz, *Property, Privacy, and Personal Data*, 117 HARV. L. REV. 2055, 2082 (2004) (using “information market” in the context of personal data). Interesting as these concepts and areas are, they are not the same type of “information market” described and analyzed herein.

¹³ To say that there is an overarching “point” to a market beyond gains or losses of individual traders is not a novel concept. After all, the justification for stock markets is that they readily raise capital for business and thereby fund all sorts of technological innovation. See, e.g. Claudio Michelacci & Javier Suarez, *Business Creation and the Stock Market*, 71 REV. ECON. STUD. 459, 459 (2004) (discussing how the stock market “encourages business creation, innovation, and growth by allowing the recycling of ‘informed capital’”).

¹⁴ It is the deliberate structure, the intention to capture information, that differentiates information markets from typical capital markets. Capital markets also generate a level of prediction through the process of price discovery, but this is a secondary effect, not the primary goal of such markets. See generally Michael T. Chng, *A Model of Price Discovery and Market Design: Theory and Empirical Theory*, 24 J. OF FUTURE MARKETS 1107, 1108-10 (2004) (describing price discovery function performed by derivatives markets).

This Article focuses on why information markets have covered certain subject areas, sometimes of minor importance, while neglecting other subject areas of greater significance. To put it another way, why do information markets exist to predict the outcome of the papal conclave and the Michael Jackson trial, but no information markets exist to predict government agency policy outcomes, Supreme Court decisions, or the rulings in Delaware corporate law cases? Arguably, from either a dollar value or a social utility perspective, these areas of law and business would be more important than the outcome of the papal conclave or the Jackson trial. Why, then, do these “frivolous” markets on celebrities like Michael Jackson thrive, while others with more serious aims have yet to be started?

In attempting to answer this question, we first wish to give the reader a more detailed explanation of information markets and how they work. Section II therefore recounts the predictive successes of information markets in everything from presidential elections to the television game show “*Who Wants to Be a Millionaire?*.” Then we present data from interviews with market founders about their motivations in starting various information markets. In Section III, we insert the empirical data into an analytical framework, exploring where markets exist, where they do not, and some of the reasons, including legal considerations and microeconomic decisions, that affect the subject coverage of information markets. We conclude that legal considerations, in particular the laws about gambling, have had a significant impact on the development of information markets.

In Section IV, we contend that, despite a trend toward information markets in entertainment and politics, the emergence of an information market in any particular

subject area is at least partially the product of a random walk, meaning that it cannot be predicted in advance from past data.¹⁵ Finally, in the last part of our Article, we contemplate whether information markets must endure the vagaries of the random walk or whether they could develop in a more organized and systematic way, either through private institutions or through government action. The answers have implications for legal regulatory efforts, government sponsorship, the development of this area of technology, and, perhaps more broadly, the growth of any new field that individual entrepreneurs develop.

II. ORIGINS OF INFORMATION MARKETS

A. How Information Markets Work

In this first section, we provide a brief description of how information markets work. Information markets organize and aggregate individual knowledge into a collective judgment. Although information markets are a new idea, their central insight — that the collective judgment of the many can be wiser than the conclusion of one person — are embedded in many of our legal institutions. From the jury system to multi-member courts, the legal system frequently entrusts determinations of guilt, innocence, and liability to collectives.¹⁶ Information markets take the idea of group decisionmaking

¹⁵ See BURTON G. MALKIEL, 24 A RANDOM WALK DOWN WALL STREET (8th ed. 2003) (defining random walk as “one “in which future steps or directions cannot be predicted on the basis of past actions.”). Greater detail about the meaning of a random walk in the context of the emergence of information markets is provided below.

¹⁶ E.g., U.S. CONST. amend. VI. The jury’s role is, at least in part, premised on the idea that a group will be able to assess facts more accurately than an individual fact-finder. The premise has mathematical support; the Condorcet Jury Theorem suggests that when choosing between two alternatives, one of which is correct, juries will reach the correct result more often than a single fact-finder. See Richard A. Posner, *An Economic Approach to the Law of Evidence*, 51 STAN. L. REV. 1477, 1498 (1999) (listing

far further, greatly expanding the number of participants.¹⁷ Instead of a twelve-member jury or a three-judge panel evaluating and weighing a factual assessment about a past event, in an information market, thousands of people can join together to predict events, such as the outcome of a presidential election.¹⁸

Each trader in the information market acts to maximize his or her own reward. At the same time, the organizers of the market aggregate the results and harvest the valuable information that individuals have generated. The theory behind information markets is loosely related to the semi-strong version of the efficient market hypothesis (EMH), which holds that, in a properly functioning capital market, the prices of securities will reflect all relevant publicly available information.¹⁹ The price of a security on the market encodes a significant amount of information, including beliefs about the efficacy of

Condorcet Jury Theorem as one factor that improves jury's ability to assess facts with accuracy). See Jonathan Remy Nash, *A Context-Sensitive Voting Protocol Paradigm for Multimember Courts*, 56 STAN. L. REV. 75, 76-77 (2003) (discussing voting patterns on multimember courts as well as game theory and the doctrinal paradoxes that can accompany voting on such courts); Michael Abramowicz, *En Banc Revisited*, 100 COLUM. L. REV. 1600, 1602, 1632 (2000) [hereinafter Abramowicz, *En Banc*] (proposing, innovatively, use of visiting panels from across circuits to sit *en banc*, and basing this proposal in part on Condorcet Jury Theorem).

¹⁷ Juries and multi-member courts engage in a deliberative function, which is valued as helping to achieve more accurate outcomes as well as for process reasons. Information markets, however, are not deliberative, and information markets employ incentives for correct predictions. Although there are these significant differences, we mention juries and multimember courts to emphasize that group decisionmaking is commonly accepted in our legal system.

¹⁸ See *infra* notes 36-42 and accompanying text (discussing how Iowa Electronic Markets have been predicting the outcomes of elections since 1988).

¹⁹ Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FIN. 383, 383 (1970); Ronald J. Gilson & Reinier H. Kraakman, *The Mechanisms of Market Efficiency*, 70 VA. L. REV. 549, 552-53 (1984).

management, the potential for future products and possible market expansions.²⁰ In other words, most markets have a “price discovery” function, aggregating information and predictions into the current price of that security.²¹ In traditional capital markets, however, the information-seeking aspects are, to a certain degree, by-products of trading and raising capital. In contrast, this information-seeking is the sole reason for the information market’s existence.

In his recent popular book, *The Wisdom of Crowds*, James Surowiecki explains numerous ways in which such collective knowledge can be employed.²² Surowiecki describes an experiment in which individuals tried to guess the correct number of jelly beans in a jar, for which they would win a prize.²³ The experimenter took the individual guesses and averaged them, resulting in a number only a few away from the actual number of jelly beans.²⁴ The average of all the guesses was extremely accurate.²⁵ Whether individuals are asked to estimate the location of a sunken submarine,²⁶ to guess

²⁰ See Fama, *supra* note 19 at 383.

²¹ See generally Cass Sunstein, *Group Judgments: Statistical Means, Deliberation, and Information Markets*, 80 N.Y.U. L. REV. 962, 1023 (2005) (explaining how information markets can improve group decisionmaking processes and mentioning price discovery function).

²² JAMES SUROWIECKI, *THE WISDOM OF CROWDS* xiv, 3-4 (2004).

²³ *Id.* at 5; Jack L. Treynor, *Market Efficiency and the Bean Jar Experiment*, FIN. ANALYSTS J., May-Jun. 1987, at 50.

²⁴ *Id.*

²⁵ In Treynor’s experiment, the jar had 850 jelly beans. The average of the group’s guesses was 871, and of the fifty-six who made guesses, only one was more accurate than the group average. *Id.*

²⁶ SUROWIECKI, *supra* note 29 at xx-xxi.

the weight of an ox,²⁷ or to help a contestant on the game show “*Who Wants to Be a Millionaire*,”²⁸ groups provide accurate answers to questions that most individuals would not be able to answer on their own.

At present, there are sixteen information markets open to the general public,²⁹ and approximately one to two dozen internal, company, or private information markets that operate to make predictions.³⁰ Perhaps most notably, especially during the past two hotly contested presidential elections, is the Iowa Electronic Markets (“IEM”).³¹ The IEM, started in 1988 by academics at the University of Iowa Business School, has been operating since that time to predict the outcomes of various elections.³² An individual

²⁷ *Id.* at xi-xiii.

²⁸ On the television program “*Who Wants to Be a Millionaire*” contestants had to answer trivia questions in multiple-choice format. Each contestant had several “lifelines” that they could use, including narrowing the options, telephoning a friend, and polling the audience. Although the first two options were often helpful, the audience for the television program was the most helpful of all, achieving a 91 percent success rate. *Cf.* Saul Levmore, *Conjunction and Aggregation*, 99 MICH. L. REV. 723, 734 n. 22 (2001) (providing “*Who Wants to Be a Millionaire*” poll of the audience as illustration of the Condorcet Jury Theorem).

²⁹ *See* Appendix A, *infra*.

³⁰ The estimate about the number of private markets is from an interview with Robin Hanson, who estimates there are between one and two dozen internal private markets. Telephone Interview with Robin Hanson, Associate Professor of Economics, George Mason University (Aug. 18, 2005).

³¹ *See, e.g.*, Jordan Erin, *Iowa Electronic Markets Yield Near-Accurate Results* DES MOINES REG., Nov. 10, 2004, at B5, *available at* 2004 WL 90800910. The IEM trades at <http://www.biz.uiowa.edu/iem/>.

³² Joyce Berg, et al., *Results from a Dozen Years of Election Futures Markets Research 1* (Nov. 2000) at http://www.biz.uiowa.edu/iem/archive/BFNR_2000.pdf [hereinafter Berg, et al., *Results*] The IEM has also expanded into predictions further afield from its base of political predictions. *Id.* at 7 n.10; Jordan Erin, *U of I Markets Tapped to Predict Flu Activity*, DES MOINES REG., Nov. 22, 2004, at B1, *available at* 2004 WL 100489665.

trader is limited to a \$500 investment, so although the financial stake of any one person in the outcome is modest, each still has a financial incentive for making a correct prediction.³³

The IEM has predicted the outcomes of elections more accurately than polls have, beating the polls seventy-six percent of the time.³⁴ This accuracy occurs despite the fact that researchers at the University of Iowa have concluded that many of the market participants exhibit a strong bias toward one candidate or other.³⁵ Apparently, the market is able to correct for these biases through arbitrage.³⁶ Sensing an opportunity for profit, arbitrageurs temper the ideological biases that some of the participants bring with them when they make their initial investment in the IEM.³⁷

³³ See Saul Levmore, *Simply Efficient Markets and the Role of Regulation: Lessons from the Iowa Electronic Markets and the Hollywood Stock Exchange*, 28 J. CORP. L. 589, 589 (2003) [hereinafter Levmore, *Simply Efficient Markets*].

³⁴ Joyce Berg, et al., *Accuracy and Forecast Standard Error of Prediction Markets* 12-13, 33 tbl. 3. (July 2003) at <http://www.biz.uiowa.edu/iem/archive/forecasting.pdf> [hereinafter Berg, et al., *Accuracy*].

³⁵ Berg, et al., *Results*, *supra* note 37, at 5. The average trader is younger, more likely to be a white male, Republican, and of a higher socio-economic status than the average voter. Berg, et al., *Accuracy*, *supra* note 39, at 10.

³⁶ See, e.g. Donald C. Langevoort, *Taming the Animal Spirits of the Stock Markets: A Behavioral Approach to Securities Regulation*, 97 NW. U. L. REV. 135, 140 n. 15 (defining arbitrage as the “process by which informed traders buy or sell in such a way as to eliminate any mispricing caused by uninformed trading. For example, when a stock becomes overvalued because uninformed traders are bidding it up, informed traders would sell, hence moving the price back to its rational expectations equilibrium.”)

³⁷ Berg, et al., *Results*, *supra* note 37, at 6.

Another successfully functioning information market is the Hollywood Stock Exchange (HSX), which has more than 400,000 registered accounts.³⁸ The HSX is a “fantasy stock market,” allowing trades in “virtual” money, and is successful in predicting which movies will be blockbusters and which will be box office bombs.³⁹ Although traders set the market price for shares of a movie’s stock, the price is tied to the movie’s financial performance.⁴⁰ Once the film has been in release for a month, the stock “delists” and the shareholders are cashed out.⁴¹ Shareholders receive an amount of virtual money pegged to the amount of real money that the movie made during that period. Traders may also sell their stocks short if they believe that a movie’s stock values are overpriced.⁴² In addition, the HSX allows traders to guess the outcomes of the

³⁸ The Hollywood Stock Exchange has its website and trading market at www.hsx.com. See also David M. Pennock, et al., *The Power of Play: Efficiency and Forecast Accuracy in Web Market Games 5* (NEC Research Institute Technical Report 2000-168 2001), at <http://artificialmarkets.com/am/pennock-neci-tr-2000-168.pdf>.

³⁹ Norm Alster, *It’s Just a Game, But Hollywood is Paying Attention*, N. Y. TIMES, Nov. 23, 2003 at 34, available at <http://www.hsx.com/about/press/15709.pdf> and 2003 WLNR 5231448; Jack M. Balkin, *Virtual Liberty: Freedom to Design and Freedom to Play in Virtual Worlds*, 90 VA. L. REV. 2043, 2070 (2004) (discussing the creation of “virtual” property in online games). See Levmore, *Simply Efficient Markets*, *supra* note 38, at 593 (“HSX offers good predictions of a film’s gross receipts before release and, relatively speaking, even better predictions after opening weekend — when a large number of traders have some information in the form of (or at least the possibility of) observing the finished film on screen, along with audience reactions. Apparently, studios have begun relying on these estimates to structure the distribution of their films.”) See also Russ Ray, *Prediction Markets: Betting on Risk Management*, RISK MGMT., Apr. 1, 2004, at 58, available at 2004 WL 66261967.

⁴⁰ See www.hsx.com; See also Pennock et al., *supra* note [] at 6.

⁴¹ Pennock et al., *supra* note [] at 6.

⁴² *Id.* In traditional financial markets, a short sale is defined as the “sale of borrowed shares by an investor who expects the stock’s price to decline. If it does, the investor profits on the difference between the amount realized when the shares were sold and the

academy awards, and these aggregated predictions have proven to be startlingly accurate.⁴³

Other successful information markets are smaller, and private, limiting participation to the members of a particular organization. For example, Hewlett Packard (HP) used an internal information market to predict monthly sales volumes.⁴⁴ The information market in this case was thin, that is, it encompassed a relatively small number — twenty to thirty — of participants.⁴⁵ The market encompassed participants from across departments, and these participants remained anonymous.⁴⁶ Despite the small numbers of participants, the information market produced more accurate forecasts than those that the company had

lower price paid to ‘cover’ the short position. If, however, the stock goes up, the investor's loss is limited only by how quickly the short sale is covered.” Priscilla Ann Smith, *Short-Sale Data Can Signal More Than Pessimism*, WALL ST. J., Dec. 17, 1986, available at 1986 WL-WSJ 240163. For further discussion of short-selling as well as financial derivatives, and their importance for the study of corporate law, see Frank Portnoy, *Adding Derivatives to the Corporate Law Mix*, 34 GA. L. REV. 599, 604-605 (2000).

⁴³ In a widely publicized story in 2000, *The Wall Street Journal* queried members of the academy in order to formulate predictions and publish a story touting the winners in advance of the awards show. Despite obtaining this inside information, the newspaper underperformed against the HSX, which predicted more accurately which nominees would win academy awards. See Levmore, *Simply Efficient Markets*, *supra* note 38, at 594; Lisa Gubernick, *And the Winner Is*, WALL ST. J., Mar. 24, 2000, at W1, available at 2000 WL-WSJ 3022872; see also Justin Lahart, *Trading the Oscars*, CNN Money, Mar. 11, 2003, available at http://www.hsx.com/about/press/030311_1.htm.

⁴⁴ Charles R. Plott & Kay-Yut Chen, *Information Aggregation Mechanisms: Concept, Design and Implementation for a Sales Forecasting Problem* 6, (California Institute of Technology Working Paper 1131, March 2002) at http://www.hpl.hp.com/personal/Kay-Yut_Chen/paper/ms020408.pdf.

⁴⁵ *Id.* at 5, 10.

⁴⁶ *Id.* at 10.

put forward officially.⁴⁷ In addition to the IEM, HSX, and the internal HP market, there are currently numerous other information markets that are successfully functioning.⁴⁸

B. Interviews with Market Founders

Having set forth an overview of current information markets, we turn to what some of the founders say about the origins of their markets. Our research objectives were more journalistic than scientific. In other words, while we tried to interview as many founders who we could reach and who were willing,⁴⁹ we do not pretend that we conducted a scientific survey. Rather, our hope was to add color and factual detail to what might otherwise be purely an intellectual analysis. We found the results interesting and suggestive of broader themes explored below regarding randomness in the origin of information markets.

One of the leaders in the field of information markets is Robin D. Hanson, an economics professor at George Mason University. He has been involved in founding two information markets and worked to found another one (which fell victim to political

⁴⁷ *Id.* at 12-16. Part of this difference might be explained by a failure of individuals to share information across departments, but this also might be the result of incentives that skew official sales predictions. For example, there might be extreme pressure from top management to reach a particular sales goal; at the same time, individual salespeople might have incentives to underestimate goals so that they can later “look good” when they exceed the sales quota. *Cf.* Gary F. Goldring, *Mandatory Disclosure of Corporate Projections and the Goals of Securities Regulation*, 81 COLUM. L. REV. 1525, 1535 (1981) (discussing underestimate in corporate projections); William S. Laufer, *Corporate Liabilities, Risk Shifting and the Paradox of Compliance*, 52 VAND. L. REV. 1343, 1413, 1413 n.295 (1999) (discussing pressure on employees to meet sales goals).

⁴⁸ *See* Appendix A, *infra*.

⁴⁹ [Note to Eds: We are still in the process of interviewing various market founders. More interviews will be forthcoming, and there will be additional ones added before we provide you a final version].

controversy.) Hanson was first involved in creating an information market in 1989-1990 with an internal information at Xanadu Inc., a computer company attempting to forecast whether they would deliver their product.⁵⁰ Why did they pick this subject for one of the early information markets? Essentially, it was a subject that the company's employees were "very interested in."⁵¹ The employees at Xanadu recognized that they had a tendency to fool themselves about when they might be able to complete a product, and the information market was a way to impose discipline on their predictions.⁵²

The second information market in which Hanson was involved was the Foresight Exchange, which began in September 1994.⁵³ Most of the early predictions involved science-related topics such as cold fusion or global warming. This was a response to Hanson's suggestion to attract participants to bet on science-related topics.⁵⁴ Why did this suggestion arise? Hanson had a long-standing interest in the philosophy of science, stretching from his academic work as an undergraduate and master's student.⁵⁵

Finally, Hanson may be best known for his work with the Policy Analysis Market ("PAM"), a proposed information market about political instability in the Middle East sponsored by the Defense Advanced Research Projects Agency ("DARPA"), an agency

⁵⁰ Telephone Interview with Robin D. Hanson, Associate Professor of Economics, George Mason University (Aug. 18, 2005).

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.*

of the Department of Defense.⁵⁶ Why was this subject area chosen? Initially, Hanson was looking for the subject of the “most dollar value to the Department of Defense” and thought political instability in the Middle East was the most likely subject.⁵⁷

PAM did not have a happy future. Two U.S. senators criticized the project, the Defense Department withdrew its sponsorship, and its supervisor resigned.⁵⁸ Hanson observes that this outcome was shaped by factors that had nothing to do with the merits of PAM. In the political context, DARPA administrator John Poindexter (who to Hanson’s knowledge had no direct involvement with PAM) was politically controversial, and his political opponents, according to Hanson, were “looking for something to get him.”⁵⁹ Hanson also notes that Democrats are prone to attack Republicans for being too friendly toward markets, and he notes, “If [Albert] Gore was elected, we’d still be going.”⁶⁰

Other founders of information markets were influenced more by the business potential than science or politics. Emile Servan-Schrieber, the chief executive officer of NewsFutures, Inc., runs three public information markets: a current events market called

⁵⁶ *Id.* This project has sometimes been characterized as involving “terrorism futures.” Hanson rejects this characterization as inaccurate and notes that global deaths from terrorism was merely one of many global parameters to be explored in the market. *Id.*

⁵⁷ *Id.*

⁵⁸ See ROBIN D. HANSON, THE INFORMED PRESS FAVORED THE POLICY ANALYSIS MARKET at 2 (Aug. 8, 2005), available at <http://hanson.gmu.edu>.

⁵⁹ Telephone Interview with Robin D. Hanson, Associate Professor of Economics, George Mason University (Aug. 18, 2005).

⁶⁰ *Id.*

NewsFutures, a market in technology and business called Innovation Futures, and a Tech Buzz Game about information technology.⁶¹

Servan-Schreiber created his company in part as a result of his long-running interest in journalism.⁶² His family has run several press ventures in France, and Servan-Schreiber thought that prediction markets “could be the basis for a new type of journalism: let the readers collectively predict what will happen tomorrow based on what they read today. And treat those predictions as content themselves, yielding a truly new form of interaction between a media outlet and its audience.”⁶³ Servan-Schreiber’s co-investor, Maurice Balick was motivated by his belief “in the ability of free markets to allocate resources efficiently and predict outcomes through information aggregation.”⁶⁴ Yet despite these academic interests, in operating the market Servan-Schreiber is “definitely business focused.” He hopes to make a profit, “if only because it’s hard to argue that you’re contributing something useful if no one is willing to pay for it.”⁶⁵

[Note to Editors: Data from additional interviews to come.]

In sum, the founders’ stories suggest that their information markets are, at least to some degree, extensions of their personal experiences. Hanson studied philosophy of

⁶¹ E-mail from Emile Servan-Schreiber, CEO NewsFutures, to Robert L. Rogers (Aug. 3, 2005) (on file with author) [hereinafter Servan-Schreiber Interview]. In addition to these public markets, NewsFutures also offers private information markets to corporate clients.

⁶² *Id.*

⁶³ *Id.*

⁶⁴ E-mail from Emile Servan-Schreiber, CEO NewsFutures, to Robert L. Rogers, containing statement of Maurice Balick, CEO NewsFutures (Aug. 6, 2005) (on file with author) [hereinafter Balick Interview].

science, and one of his initial markets focused on scientific questions. Servan-Schreiber came from a press family and saw the potential of information markets to shape media. None of this is astonishing, but it does have implications for the predictability of the emergence of information markets, a subject that we address in greater detail below. But before pondering the unknowable, we attempt to set forth as much as possible about what can be assessed about trends in the birth of information markets.

III. TRACING TRENDS IN MARKET DEVELOPMENT

In this section of the Article, we analyze the subject coverage of the existing information markets and conclude that, for the most part, markets have most commonly arisen in two broadly defined areas: political elections and entertainment.

In the first part of this section, we analyze why this might be so, specifically examining the business models that many information market founders use and what impact those business models have on the subject matter of the market. Besides looking at the “supply side,” we also examine the attractions to market participants and ask why participants might be more willing to participate in certain markets than in others. In doing so, we use insights from cognitive psychology, including the “flow” experiences that psychologist Mihaly Csikszentmihalyi has identified.

In the second part of this section, we examine the underdeveloped markets — areas where information markets could potentially lead to predictions that would significantly advance human knowledge or generate wealth — but where markets have yet to be developed. And, in the final part of this section, we discuss the role that

⁶⁵ Servan-Schreiber Interview.

structural factors, such as legal constraints, have had in the development of information markets in particular areas.

A. THE LURE OF INFORMATION MARKETS

To date, most information markets tend to cluster around two broad subject areas, politics and entertainment. Approximately seventy percent of the current public information markets deal with these two subject areas alone. This seems to be a startling subject concentration, especially given the proven predictive capabilities of information markets and the number of questions that they could help to answer.

Apart from gambling websites, there are currently sixteen robust functioning public information markets. Of these sixteen public information markets, five have elections or politics as their central focus. Indeed, one of the most groundbreaking paradigmatic information markets, the IEM, described in Section II, *supra*, has as its focus the outcome of the U.S. presidential elections. Dealing with foreign politics, the Austrian Political Stock Markets focus on Austrian elections,⁶⁶ Wahlstreet focuses on the outcome of German politics,⁶⁷ and the Election Stock Market focuses on Canadian elections.⁶⁸ Another market, the Political Stock Exchange,⁶⁹ allows participants to purchase shares of politicians and shares of political events, with participation by the general public using virtual money.⁷⁰

⁶⁶ <http://zwickl.ibab.tuwien.ac.at/apsm>.

⁶⁷ <http://www.wahlstreet.de/>

⁶⁸ <http://esm.ubc.ca>.

⁶⁹ <http://www.PoliticalStockExchange.com/>

⁷⁰ *Id.*

The other popular area for information markets is entertainment. While “entertainment” is a broadly defined area, we use it to mean the Hollywood entertainment industry, including movies and television productions, and also to encompass sporting events. Of the sixteen public information markets, three have entertainment or sports as their central focus. The Hollywood Stock Exchange, described in Section II, *supra*, has its focus the prediction of whether a particular movie will be a success at the box office. Another example is the Celebdaq market,⁷¹ which allows participants to buy shares of a celebrity, with incentives based on the celebrity’s popularity, and dividends based on the amount of press coverage that the celebrity receives. Finally, TradeSports⁷² allows the general public to invest real money in futures contracts, primarily for sporting events, but also for politics, current events, and a few other topics.

Of the sixteen public information markets, three additional markets also contain significant coverage of politics and entertainment. The News Futures⁷³ market allows virtual money participants the opportunity to predict news, financial, sports, and entertainment news. Although the focus of the market is best classified as “current events,” meaning newsworthy current stories, a significant portion of the predictions deal with the entertainment industry, sporting events, or politics. Another information market, InTrade,⁷⁴ allows participants to make a variety of predictions, including predictions

⁷¹ www.bbc.co.uk/celebdaq/

⁷² <http://www.tradesports.com>

⁷³ www.us.newsutures.com/index.html

⁷⁴ <http://www.intrade.com>

about politics and entertainment. Finally, the Foresight Exchange⁷⁵ allows participants to predict a number of questions, some of which involve the outcomes of future political elections. Although the focus of the three markets is current events, that includes heavy doses of both politics and entertainment.

Indeed, the forgoing analysis shows that out of the sixteen public information markets currently operating, five have political elections as their focus, three have entertainment and sports as their focus, and three have a broader focus but one that incorporates politics, sports, and entertainment as a major concentration of the market. Therefore, eleven of sixteen public markets, or roughly 70 percent of the total are concentrating in the areas of politics and entertainment. And so the next questions to ask are why are these subject areas so highly developed, when others, that are of possibly far greater social utility, have been relatively neglected? What are the attractions of these markets to founders? What attracts participants to trade in these markets? The next two sections provide some answers.

1. Attractions to Founders

Although the intellectual challenges of the field may be an attraction, the founders, particularly of the for-profit exchanges involving real money, also have financial motivations.⁷⁶ While this is not true of non-profit educational ventures such as the IEM, which is run by the Iowa University School of Business, of the sixteen public markets, nine are run by private for-profit firms. We have discussed above what some of the founders said about their motivations for starting particular markets. Here, we look

⁷⁵ www.ideosphere.com

⁷⁶ *See, e.g.,* Servan-Schreiber Interview.

more broadly at larger trends that seem applicable to their choices, including the selection of a business model.

Determining which subject areas will create profits is in turn tied to the choice of business model that information market entrepreneurs select. Firms running information markets seem to be choosing business models similar to those employed by traditional brokerage firms or the internet businesses of the new economy. In part, it is these microeconomic decisions about the form of business model that drive the decision about what subject matter the information markets will cover.

Under the business model that a traditional brokerage firm uses, investors are initially charged a fee for setting up an account. The brokerage firm also charges investors for managing their portfolio.⁷⁷ If the investors prefer a more active role, the brokerage firm will charge fees for executing their trades.⁷⁸ Brokerage houses sustain themselves by charging investors what is essentially a “transaction cost” on their trades.

In the context of information markets, several of the currently existing markets generate profits through such a traditional brokerage business model. For example, Tradesports charges customers to establish an account, and then charges a monetary fee for each trade that a customer executes on the information market.⁷⁹ Increased attention to any particular predictive market will result in more accounts being opened. More accounts lead to correspondingly higher revenues for the information market maker.

⁷⁷ Jack Naudi, *Should You Hire a Financial Advisor?*, ST. LOUIS POST-DISPATCH, April 24, 2005, at E5 (describing how brokerage accounts work).

⁷⁸ *Id.*

⁷⁹ <http://www.tradesports.com>

Similarly, an increase in trading results in higher commissions for the information market maker. An increase in the amount of publicity or attention will lead to an increase in the amount of revenue for those who run the exchange.

Under an internet business model, a website offers a program or service, usually either for free or at a de minimus cost to the user. To pay for its operating costs, the website sells a portion of space on its page to advertisers.⁸⁰ Thus, the potential for profit is tied to the number of “hits” or “eyeballs” that the page receives, in other words, the number of visitors the page is able to attract with its free service.⁸¹ As the websites had no revenue stream from users, many stock analysts widely criticized this business model as impractical.⁸² Despite these criticisms, it seems that many firms,⁸³ as well as emerging information markets, are still using this model.

Since the key to generating profits under both the traditional brokerage and internet business models is to increase the number of individuals opening accounts, the amount of trading, or the number of hits that a particular website receives, it stands to reason that many information markets will be geared to attract the broadest audience possible. Information market firms create predictive markets based on the number of participants they think a particular subject area will attract. And it appears that many

⁸⁰ Stephen Baker, *Where the Real Internet Money Is Made*, BUS. WK., Dec. 27, 2004, at 98.

⁸¹ *Id.*

⁸² See Denise Caruso, *In the Internet Rat Race, Greater Value Seems To Be Put on Devising the Next Business Plan Than on Making It Work*, N.Y. TIMES, Oct. 25, 1999, at C4 (critiquing internet business models).

⁸³ For one example of a firm that is still using this model, consider yahoo. See www.yahoo.com.

information market entrepreneurs are currently doing this by selecting topics and areas that they think will appeal to a mass audience, such as sports, entertainment, and politics.

Rather than starting with the question of what predictions would be most valuable – and then structuring a market to capture that information – what is currently occurring is that market entrepreneurs are catering their markets to the areas that will seemingly attract the most participants. And this seems somewhat intuitive: public markets on popular topics will succeed, whereas public markets on the likelihood of dull events will fail. The idea of pitching the markets to a mass audience to attract publicity and generate fees or advertising, however, does have one serious consequence. The consequence of such a business model is that valuable predictions are potentially lost. Divorced from its information gathering and predictive functions, an information market might become little more than a device for entertainment. If the only thing that matters is attracting traders, and the information generated is not particularly important, then the information market has little more social utility than the poker night at a local bar.

One of the greatest challenges facing information market entrepreneurs in the coming years will be to implement a business model that allows a profit from the predictions the information market generates. For now, the information market founders are making profits by attempting to pull in as broad an audience as possible. Regardless of whether this model results in the most useful pattern of development, it is true that any successful information market is going to have to draw participants, ideally knowledgeable ones in the subject area of the market. In the next section, we turn to the

elements that may attract participants to trade on information markets, and why certain subjects seem to be more popular with a mass audience.

2. Attractions to Participants

On an intuitive level, it seems to make sense that markets that are more “easy” or “fun” or a combination of these two elements, are bound to get more attention and, at least initially, draw more participants.

By “easy” we refer to the ease of gathering information about the uncertain event in question. For example, one could compare becoming informed about the Michael Jackson trial, with nightly coverage by the broadcast media with the difficulty in obtaining information to predict the rate of new housing starts for the quarter. Predicting new housing starts requires specialized knowledge and analysis of the macroeconomy, the construction industry, and mortgage rates. All of this is knowledge that the average person would not know offhand, and, because of bounded rationality,⁸⁴ might never take the time to analyze. Although the outcome of trials also depend on many complicated factors, at the very least the press coverage of the Jackson trial provoked opinions from the general public, reactions that could mimic those of the jury in the actual trial.⁸⁵ Politics are also “easy” in the sense that the news media, both print and broadcast,

⁸⁴ Bounded rationality refers to the idea that individuals can only absorb and learn a certain amount of information. See Herbert A. Simon, *A Behavioral Model of Rational Choice*, 69 Q. J. ECON. 99, 104-05 (1955); Russell Korobkin, *Bounded Rationality, Standard Form Contracts, and Unconscionability*, 70 U.CHI. L. REV. 1203, 1222-23 (2003) (exploring idea that bounded rationality leads consumers to agree to terms in form contracts).

⁸⁵ This raises the interesting question of whether information markets work best when the market participants have roughly the same amount of knowledge as the actual decisionmakers. The question is, however, largely beyond the scope of this Article.

currently give extensive coverage to political races. Throughout the course of the presidential races, for example, the popular press will typically cover campaign stump speeches, the candidates' publicity tours, as well as the commentary given to the presidential and vice-presidential debates. In addition, major news outlets often have commentary on polling as well as trends among voter demographics. All of this information makes it relatively easy for the average person to stay well-informed about the election. While the media also has this information, individuals may also be able to gather additional information about a candidate's appeal. Simply put, some candidates are more popular with voters than with the press, and information markets with politics as their focus can reflect this fact.

Politics may also be a popular subject for markets because of the ease of setting up such a market. With a typical election in the United States, there are usually only two major party candidates running for office. Participants in the market are asked to make what is essentially a binary choice between who will win or lose.⁸⁶ Setting up such a "binary" market is easier for market organizers than is setting up a market in which the purpose is predicting the percentage of the vote that each candidate would receive. In addition, elections are "easy" because at the end of election day, all the votes are counted, and there is a clear "winner" and "loser," which makes calculating payouts considerably easier.⁸⁷

⁸⁶ Of course, this is not always true. Consider third-party spoilers such as Theodore Roosevelt, Ross Perot, and Ralph Nader. *See generally* Jesse Ventura, *Surviving as a Third-Party Candidate in a Two Party Country*, 13 STAN. L. & POLICY REV. 179, 179 (2002) (recounting Ventura's successful third-party gubernatorial bid).

⁸⁷ This is not always the case, as the 2000 presidential election demonstrated, but in the vast majority of elections, the winner and loser are rapidly ascertainable.

In addition, it may be that there is an element of “fun,” “play,” or “challenge” in an information market dealing with politics or entertainment that may make it appealing. To try to answer this question about the popularity of political and entertainment markets on the demand side, we turn to the social psychology work of Mihaly Csikszentmihalyi.⁸⁸ In his work, Csikszentmihalyi has studied how individuals spend their time, whether working, sleeping, engaging in housework or leisure activities, and had them rate their moods.⁸⁹ Examining a large number of these mood diaries, Csikszentmihalyi determined that individuals had elevated moods when they engaged in particular activities that triggered “flow states.”⁹⁰

According to Csikszentmihalyi, flow states involve concentration, the use of skills, learning, and adaptation.⁹¹ Engaging in activities that are challenging and at the same time enjoyable, an individual experiences flow, “the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great costs, for the sheer sake of doing it.”⁹² Csikszentmihalyi attributes much of a person’s happiness and feelings of accomplishment to entering flow states.⁹³

⁸⁸ *See generally* MIHALY CSIKSZENTMIHALYI, *FLOW THE PSYCHOLOGY OF OPTIMAL EXPERIENCE* (1990).

⁸⁹ *Id.* at 4.

⁹⁰ *Id.* at 4-5.

⁹¹ *Id.*

⁹² *Id.* at 4.

⁹³ *Id.* at 40-41.

Traders who participate in particular information markets may experience a form of flow. Making correct predictions about sporting events or political elections involves a challenge, although perhaps one that, at the same time, does not involve too much of a transaction cost in acquiring the information necessary to be competitive in the market. Elements of this can be seen in the popularity of play-money exchanges as well as the sports gambling industry. The popularity of virtual money markets suggest that people are often motivated to participate in information markets, as Wolfers and Zitezewitz have noted, “through the thrill of pitting one’s judgment against others.”⁹⁴

To some extent, there currently is an element of “fun” and challenge when either professional stock analysts or “day traders” follow financial news and developments and then execute trades. But information markets, especially those that take as their subject celebrities and sporting events, carry this idea even further. For such markets incorporate popular and enjoyable leisure activities, and then add the dimension of challenge and competition.

3. Structural Factors

In addition to the desires of the founders and the attraction of participants, additional factors affecting all parties that influence where information markets have appeared. We identify some of the significant structural factors below.

One of the most obvious structural factors is the legal restrictions on information markets. Robin Hanson has suggested that legal barriers have kept people away from

⁹⁴ Justin Wolfers & Eric Zitezewitz, *Prediction Markets* 19 (AEI-Brookings Joint Ctr. for Regulatory Studies 2004), available at <http://www.aei-brookings.org/admin/authorpdfs/page.php?id=1027> (also published in THE JOURNAL OF ECONOMIC PERSPECTIVES, vol. 18, no. 2).

developing information markets,⁹⁵ and Emile Servan-Schreiber notes that most of the jurisdictions in which he and his business partner live ban on-line gambling, so therefore “we are constrained to operate only play-money markets.”⁹⁶ This restriction has influenced how NewsFutures operated its markets because the “economic constraints of operating play-money markets are very different from those of operating real-money-markets. We have had to rely on media partnerships, corporate sponsorships, generating high-value data, etc.”⁹⁷ The IEM, a market using real money in the United States went so far as to obtain a no-action letter from the Commodities Futures Trading Commission to assuage legal concerns. Clearly legal restrictions (and jurisdictions where they are less onerous) have influenced the creation of information markets.

Apart from this drawback, a number of other structural factors likely have aided the development of information markets. One is the similarities with traditional polling and constitutionally protected speech. Participants and regulators may recognize as a form of polling the expression of an opinion on the outcome of the presidential election or who is likely to win an Oscar award. And particularly in the case of speech on matters of public importance, the expressions of political expectations are arguably at the core of the speech the First Amendment was meant to protect.⁹⁸

⁹⁵ Telephone Interview with Robin D. Hanson, Associate Professor of Economics, George Mason University (Aug. 18, 2005).

⁹⁶ Servan-Schreiber Interview.

⁹⁷ *Id.*

⁹⁸ The possibility of gain from one’s “speech,” of course, triggers other legal models such as restrictions on gambling. In a subsequent paper, we intend to explore and evaluate these competing legal models for the regulation of information markets.

Also favorable is that information markets appear, at least on the surface, to pose no serious negative externalities.⁹⁹ Because there typically are not huge sums of money at stake, it seems unlikely that anyone is going destitute by speculating in information markets, that the markets are akin to lotteries take money from the poor, that organized crime is attracted by the gambling aspects of such voting, or that any of the harms associated with traditional gambling have appeared with information markets to any significant degree.

Likewise, it is helpful to the development of information markets that they do not pose significant start-up costs, at least in comparison to other new technologies. (Consider in contrast the costs of starting a nuclear power plant or developing a new pharmacological drug). Emile Servan-Schreiber and Maurice Balick started three information markets with \$100,000.¹⁰⁰ While consequential, at the same time it is an amount that many entrepreneurs might be able to obtain through savings, loans, or grants.

The relative ease of start-up is also helpful. The main task seems to be designing the market and attracting participants. This is not trivial, but given that most of the work is intellectual (either in design, programming, or advertising), the origin of an information market is spared the transaction costs of, say, buying a factory or hiring a large staff of employees. By their nature, opening an information market can be a much leaner operation than, say, opening a manufacturing plant.

⁹⁹ Longer term, the matter may be more complex. We have pondered elsewhere if a successful information market in predicting Supreme Court decisions might undermine the Court's legitimacy. See Miriam A. Cherry & Robert L. Rogers, *Tiresias and the Justices: Using Information Markets to Predict Supreme Court Decisions*, 103 NW. U. L. REV. __ (forthcoming 2006).

¹⁰⁰ Servan-Schreiber Interview.

Obviously, a number of other structural factors on various levels of generality might be explored, ranging from the big picture of human curiosity and to the details of the ease of using the Internet to participate in information markets. We will not attempt to exhaust these factors, but we did want to draw attention to how they, even apart from the motivations of the founders and participants, have influenced the origins of information markets.

B. UNDERDEVELOPED MARKETS

The data generated from a particular information market could be worth a great deal, either in money or in terms of social utility, but of course that all depends on what that data are and what the data are used for. Further, harnessing the power of information markets to make predictions could revise our way of thinking about areas that are dedicated to particular methods of thinking about future events. While the entertainment, sports, and political arenas already have attracted a significant number of information markets, many areas where predictive markets would be useful, such as in law or business, have yet to be developed. In this section, we examine areas where information markets could provide valuable predictions and then identify barriers that may prevent particular markets from starting.

There are still significant, broad areas where information markets do not yet exist. Ideally, where would the presence of information markets generate the most valuable information? Although there is a certain subjectivity of value,¹⁰¹ in using the term

¹⁰¹ See LUDWIG VON MISES, HUMAN ACTION 97, 204-5 (REV. ED. 1963) (describing subjectivity of value). For example, Michael Jackson himself would value the information provided by the market on his trial much more highly than would the average person who had no stake in the outcome.

“valuable” we mean information that society could use, or which could create monetary wealth for either participants or organizers.

One intriguing possibility that Professor Michael Abramowicz has advocated is government use of information markets to improve the administrative agency policymaking process.¹⁰² Professor Abramowicz proposes that information markets could predict insolvency of financial institutions,¹⁰³ make budgetary forecasts for administrative agencies,¹⁰⁴ and allow more efficient regulation by skipping notice-and-comment rulemaking.¹⁰⁵ All of these options could improve both the quality and efficiency of government policymaking.

We have proposed harnessing the knowledge of the legal community to establish an information market in Supreme Court predictions.¹⁰⁶ Naming this information market Tiresias, after the mythical Greek soothsayer, we have identified the advantages from establishing such a market.¹⁰⁷ One advantage is that Tiresias predictions would encourage settlement, which now often stalls due to mutual optimism.¹⁰⁸ Another

¹⁰² Michael Abramowicz, *Information Markets, Administrative Decisionmaking, and Predictive Cost-Benefit Analysis*, 71 U. CHI. L. REV. 933 (2004) [hereinafter Abramowicz, *Information Markets, Administrative Decisionmaking*].

¹⁰³ *Id.* at 987-88.

¹⁰⁴ *Id.* at 990-91.

¹⁰⁵ *Id.* at 993-95.

¹⁰⁶ Miriam A. Cherry & Robert L. Rogers, *Tiresias and the Justices: Using Information Markets to Predict Supreme Court Decisions*, 103 NW. U. L. REV. ___, 4 (forthcoming 2006).

¹⁰⁷ *Id.* at 1, 69-71.

¹⁰⁸ *Id.* at 70-71.

advantage from accurate predictions is that it would lead to more certain and acceptable decisions, thereby reinforcing the rule of law.¹⁰⁹

Another underdeveloped market is the prediction of corporate and securities law decisions. In passing, we previously proposed such an information market, named Midas, noting the monetary benefits that could accrue to shareholders, directors, management, and the attorneys involved in securities law cases if better predictions were able to be made.¹¹⁰ The corporate law field has a limited number of actors¹¹¹ but has knowledgeable participants comfortable with the idea of markets and a potentially high monetary value for predictive information.¹¹² Will the Securities and Exchange Commission pass a certain proposed regulation? How likely is a Delaware court to adopt a certain standard of care for directors?¹¹³ These sorts of questions are both likely to be predictable and to provide high-dollar information to market participants.

¹⁰⁹ *Id.* at 75-76.

¹¹⁰ *Id.* at 88.

¹¹¹ The primary actors are publicly traded corporations with easily identifiable interests, plaintiffs' attorneys who also have easily identifiable interests, the courts (particularly in Delaware), and the SEC.

¹¹² The higher monetary value helps attract knowledgeable traders and provides an incentive to participate.

¹¹³ *In re Walt Disney Co. Derivative Litig.*, 825 A.2d 275 (Del.Ch. 2003) (leading case on good faith in Delaware); Sean J. Griffith, *The Good Faith Thaumatrope: A Model of Rhetoric in Corporate Law Jurisprudence*, (December 2004) (forthcoming) available at <http://ssrn.com/abstract=571121> (describing and analyzing standard of "good faith" as used by the Delaware courts). Other commentators have discussed predictions of the Delaware equity courts:

In the oral agreement before the Delaware Supreme Court in *QVC*, after Justice Moore admonished counsel that the Court does not use terms like "Revlon-land," in a stage whisper he quipped further that "at least that is

Of course, this discussion of missing markets is itself incomplete. The subject areas where information markets could potentially provide predictions are nearly as expansive as human knowledge itself. Information markets either have been asked or are currently being asked to predict everything from whether (or when) certain technological and scientific advances will occur¹¹⁴ to helping firms predict sales of new products in future quarters.¹¹⁵ There are vast areas where information markets could generate value by aggregating the knowledge that individuals possess, and so far we have only barely begun to scratch the surface of potential applications.

These missing markets could potentially yield valuable information. If the microeconomic, structural, and legal factors only partially explain why these markets are underdeveloped, are there other explanations that could be offered? And can anything be done about it?

what I tell my students." n180 Trying to discern the future path of Delaware corporate law from such judicial banter is undoubtedly folly, but predicting developments in Delaware law has always been a somewhat foolish enterprise. Many learned commentators have written careful and lucid analyses predicting the trend of Delaware case law, only to have doctrinal prognostications shattered by the next big case. Predicting the course of Delaware law from prior case law is like watching clouds. They seem, at times, to take on recognizable shapes and forms, even to resemble something familiar. But you know that whatever shapes you think you see can vanish in a puff of wind.

Lawrence A. Cunningham & Charles M. Yablon, *Delaware Fiduciary Duty Law After QVC and Technicolor: A Unified Standard (and the End of Revlon Duties?)*, 49 THE BUSINESS LAWYER 1593, 1625-26 (1994).

¹¹⁴ www.innovationfutures.com/bk/index.html.

¹¹⁵ See the discussion of the Hewlett Packard market, *supra* note [] and accompanying text.

IV. THE RANDOM WALK AND BEYOND

Next, we examine whether market developments are the product of a “random walk.” After concluding that they are at least partially, we consider whether any alternatives to a random walk exist that could better aid the development of information markets.¹¹⁶

A. A Random Walk?

We have set forth partial answers to why information markets have developed in some areas and not others, but these explanations do not seem entirely to resolve the question. The appearance of any given information market remains somewhat unpredictable and idiosyncratic. This section explores the hypothesis that, despite the elements set forth in Section III.A (including microeconomic incentives and government regulation),¹¹⁷ the appearance of any particular market is essentially random. It then compares and contrasts that possibility with the far-more established hypothesis that stock prices in the major financial markets follow what has been deemed a “random walk” – that is, that short-run changes in stock prices cannot be predicted.¹¹⁸ Finally, this section addresses the consequences for the potential of information markets if the random walk hypothesis about their origins is correct.

(1) Random Origins?

¹¹⁶ See generally NEIL FLIGSTEIN, *THE ARCHITECTURE OF MARKETS: AN ECONOMIC SOCIOLOGY OF TWENTY-FIRST-CENTURY CAPITALIST SOCIETIES* (2001) (exploring how markets emerge, and the factors necessary to sustain markets from sociological perspective).

¹¹⁷ See IIIA, *supra*.

¹¹⁸ See BURTON G. MALKIEL, *24 A RANDOM WALK DOWN WALL STREET* (8th ed. 2003) (defining random walk).

The following two sections have resulted in a paradox. On the one hand, current information markets share a number of characteristics. In general, founders seem motivated by personal interests and profit seeking. Their participants are motivated partly by the possibility of success or profit, and partly by the psychological fun of playing, a reward facilitated by its compatibility with the human psyche. Certain structural elements also have allowed information markets. All of these factors set forth at least a partial explanation of how and why these markets have developed. Yet despite these areas of knowledge, the overall question of why a markets exist on certain subjects and not others remains partially unresolved. As discussed above, the explanation certainly is not social utility or even monetary value to participants.

The answer, we suspect, may be that within certain boundaries such as microeconomic incentives and government regulation, the appearance of information markets is essentially random. Successful markets tend to share the characteristics described above, such as a relatively immediate pay off and popular interest in politics and entertainment. But within those boundaries, the markets exist chiefly because they sparked the interest of an entrepreneur dedicated enough to bring the market into being.

This result seems supported by our interviews with founders of information markets. As discussed above, we focused questions on the motivation for creating markets, and we eagerly hoped for a coherent explanation of why these markets appeared in some areas and not others. What we found was that the reasons for starting a market in certain areas were personal or even idiosyncratic (Hanson's study of science, Servan-

Schreiber's family background in media). None of these data lend themselves to extrapolation into general laws of market origins.

Although we had hoped for a clearer answer to explain the conundrum, we realized that the apparent randomness was consistent with our own experience as would-be market founders. The idea for Tiresias arose by chance. The concept could easily have never been conceived at the time, or have been conceived and never developed. Most likely, others at some point would have proceeded in the area, though it would be impossible to determine when. However much we might have wished to develop a systematic explanation from the founders of other information markets, we realized that in the end, we too were pawns of randomness.¹¹⁹

(2) A Random Walk Down the Information Super-Highway

If the origin of information markets is partly random, it would not be shocking if viewed in context of the general history of financial markets. Information markets may be a new development, but capital markets are not. Stock markets have been studied exhaustively for more than a century, by first-rate theorists and investment managers seeking a competitive advantage that might result in huge profits. Billions of dollars depend on which way certain stock prices might move, and the practical and academic research devoted to this question has been correspondingly significant.¹²⁰

After such extensive efforts, many researchers kept running into the same phenomenon of randomness. One of the most famous of these academics is Burton

¹¹⁹ See generally NASSIM NICHOLAS TALEB, 2 FOOLED BY RANDOMNESS (2d ed 2004) (identifying human tendency to underestimate the degree of randomness in life).

¹²⁰ See generally MALKIEL, *supra* note [] at 125-144 (discussing fundamental and technical analysis).

Malkiel, an economist at Princeton. Malkiel defined a random walk as one “in which future steps or directions cannot be predicted on the basis of past actions.”¹²¹ In the context of the stock market, it means that short-run changes in stock prices cannot be predicted.¹²² This implies that Wall Street’s technical analysis involving charts of price movements is basically worthless,¹²³ and the ability of professions to out-perform the market by making superior stock selections based on the fundamental value of the underlying company is at best rare.¹²⁴ This is an academic finding with trillion-dollar implications for the investment markets (with vast sums spent on active management) and for the millions of individual investors whose retirement security depends upon their investment choices (such as choosing index funds, which mirror an entire market sector, instead of high-cost mutual funds run by active managers).

We suspect that a similar random walk may exist with regard to the emergence of information markets. In this context, a random walk would mean that the emergence of an information market in any narrow time period cannot be predicted from the emergence of past markets (analogous to technical analysis in the stock market) or the fundamental value of what an information market might provide. Markets for Oscar awards and pope bets exist; those for Supreme Court outcomes or SEC actions do not. Like daily

¹²¹ See BURTON G. MALKIEL, 24 A RANDOM WALK DOWN WALL STREET (8th ed. 2003) (defining random walk).

¹²² *Id.*

¹²³ *Id.* at 169.

¹²⁴ *Id.* at 200.

movement of stock prices that cannot be predicted by fundamental value or past price movements, creation of information markets appear to be driven chiefly by randomness.

(3) The Toll of the Random Walk

If the emergence of information markets is a random walk, what are its consequences? We have identified one above: The markets that currently exist do not provide the most valuable information that information markets are likely capable of producing. As discussed in Section III, a number of markets that would make valuable predictions simply do not exist.

Less obviously, the random appearance of information means that sometimes markets attempt more difficult challenges without success while neglecting easier ones where a victory might be more readily achieved. For example, consider the limited areas of Supreme Court nominees. Predicting which individual President George W. Bush would nominate to the Supreme Court is a difficult task, one that information markets did not appear to perform particularly well, at least in significant advance.¹²⁵ There are several possible reasons for this disappointing performance of information markets. There were a variety of options, not clearly defined, and the decision makers had considerable discretion about who to choose. They also did not specifically identify the top candidates

¹²⁵ The information markets reflected the conventional Beltway wisdom on the day of the nomination, which initially favored Judge Edith Clement of the U.S. Court of Appeals of the 5th Circuit. *See, e.g.*, Andres R. Martinez, “Supreme Court Market lets you put your money where your hunch is,” Knight Ridder Newspapers (July 18, 2005) (identifying Judge Clement as the frontrunner as of that Monday afternoon). On Tuesday July 19, the markets switched to indicating the selection of Judge John Roberts Jr. of the D.C. Circuit. This was before the president’s formal announcement that evening but apparently after leaks about who the nominee would be. For a blog discussion of the accuracy of the information markets on this question, see Jim Lindgren, “A Response to Orin on Tradesports,” July 20, 2005 at 3:12 a.m. at <http://volokh.com/>.

under consideration, which reduces the ability of a market to concentrate its efforts on a limited number of options. In addition, it may be harder for information markets to predict the actions of a single decisionmaker, such as President Bush, who may act from personal reasons that the public could not predict.

In contrast, compare a subsequent market on the Supreme Court Futures Market to predict whether John Roberts Jr. would be appointed to the Supreme Court. [The market predicted X, and in fact, Y. Data to come after Senate vote.] Here, there is a binary choice – appointed or not – which presents a narrower range of options compared with trying to predict the initial nominee. Similarly, a larger group of decisionmakers (100 senators) made the decision, which reduces the importance of any one particular individual who might act from idiosyncratic reasons that are less discernable to an information market.

Why should the success or failure of any individual information market matter? On the one hand, those who create and participate in information markets are satisfying their personal desires without harm to others – certainly among the rights of a free and creative people. Moreover, any use of an information market spreads knowledge of the technology, and even the failures in prediction, if analyzed, can help discover where information markets are likely to work and where they are not.

All of this is true, and we certainly intend no criticism toward those laboring to advance information markets. Nevertheless, the risks of the failure of information markets need to be considered. Information markets are still novel in concept and limited in number. Whether they will expand across the world in a variety of fields or whether they will wither into an intellectual curiosity is not yet definitively resolved. One has to

look only to the harsh rejection of the proposed Policy Analysis Market to see that, however valid the potential of information markets, there exists a risk of public rejection.¹²⁶ For their spread in the long run, information markets need to be seen as more than an intellectual parlor game, and the clearest way to show their value is to produce accurate predictions on matters of consequence. Success in this helps advance the acceptance of information markets, but predictive failures suggest the opposite conclusion: that the technology is unreliable and may not be worth funding or may not deserve the time and participation of experts. A random walk in market origin gives little way to focus new markets on the areas most likely to succeed, and thus, with the increased risk of failure, the overall success of the technology becomes riskier.

The random walk can also lead to duplication among information markets and competing efforts. Normally, competition in markets is positive. It leads businesses to offer better goods or services at lower prices. Without competition, businesses tend to become complacent, less innovative, and less consumer friendly. Indeed, a fundamental purpose of statutes such as the Sherman Antitrust Act are to promote such competition throughout the U.S. economy.¹²⁷

Although competition assists the economy overall, it is less clear that it benefits the development of information markets. As indicated above, one goal of markets is to

¹²⁶ Hanson noted that the controversy from PAM has deterred government agencies from experimenting publicly with information markets. Telephone Interview with Robin D. Hanson, Associate Professor of Economics, George Mason University (Aug. 18, 2005).

¹²⁷ See 15 U.S.C. § 1 (2000) (“Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce . . . is declared to be illegal”); 15 U.S.C. § 2 (2000) (“Every person who shall monopolize, or attempt to monopolize . . . shall be deemed guilty of a felony.”).

attract substantial numbers of what Professor Hanson has dubbed “wolves” – knowledgeable participants more likely to provide informed and insightful predictions. Given that the number of wolves with knowledge of a technical subject is inherently limited, multiple markets on the same technical subject may dilute the wolf votes and decrease the overall accuracy of the market. It may be that an information market on a specialized subject that is functioning at least reasonably well is a new sort of natural monopoly, akin to the electric company or water utility for one’s house. If so, it may be that any additional competitors add little to the accuracy rates while allowing the wolves to be outvoted by those with lesser knowledge (those who Hanson dubs “sheep”).

In addition, it will be interesting to see if the best designed markets truly become dominant in a competitive marketplace. One might expect this to happen because there are few if any barriers to entry and thus a new market offering a better design (either in ease or cost of use¹²⁸ or skill in finding questions of importance likely to be answered successfully) could easily displace the inferior incumbent. Yet there would be transaction costs in moving to a new market, not only in time but also in decreased accuracy. The cost of decreased accuracy would be especially acute in the plausible scenario where a transition of wolves to a new information market occurred incrementally and haphazardly rather than massively and simultaneously. In this case, a period of time might exist when, in either or both markets, the dilution of knowledgeable votes resulting from the wolf migration would result in the sheep votes predominating

¹²⁸ For this reason, we would not anticipate much competitive success of a market that attempted to charge individuals to participate. A free substitute likely would soon spring up, especially when many information markets such as the IEM and the Supreme Court Futures Market at the University of North Carolina are subsidized by research universities.

and thus the information market potentially becoming inaccurate. These transaction costs are hard to quantify in advance, but it might very well be that the transition costs are prohibitive and thus prevent the success of a superior competitor. Such a result would not be unique in the history of technology.¹²⁹

Finally, the random walk in the appearance of information markets muddles funding decisions. Is a given proposal the best possible subject for a new information market? Or merely what happened to appear at the time? Given the reality of limited resources that universities or foundations can devote, it would seem helpful to have some way of knowing where best to allocate the resources. In the stock market, investors can accommodate the random walk by purchasing index funds that track an entire market or market sector. If one cannot predict stock price movements, investors can just buy all the available stocks.¹³⁰ Alas, one doubts that universities and foundations will fund every

¹²⁹ As one simple example, consider the standard typewriter keyboard. The commonly accepted QWERTY keyboard was initially designed in the late 19th century for manual typewriters whose striking keys had a tendency to jam if the typist moved too quickly. To slow down the human operator, commonly used keys were placed in odd positions that required finger movements. (“E” and “T”, for example, are the two most common letters in English, yet they are placed on the top row rather than the home row.) The design succeeded in slowing down the typist, but of course, modern electronic keyboards don’t suffer from the same limitations. Yet we still keep the QWERTY keyboard, despite the slower speeds. Why? It isn’t for lack of alternative. The Dvorak keyboard, designed to let the typist move faster by placing commonly used keys on the home row, has been available since 1932. But the QWERTY keyboard was developed first and achieved market dominance. To switch, millions of typists would have to retrain, and thus far, the transition costs have proved prohibitive. See Jared Diamond, *The Curse of QWERTY*, DISCOVER MAGAZINE (April 1997). What lasts is not always what is best, but sometimes merely what was first. What economists term “path dependence” can matter.

¹³⁰ See MALKIEL, *supra* note [] at []. This has done well as an investment strategy, beating some 75 to 80 percent of all actively managed funds on an after-fee basis. See *id.* at [].

information market proposal, akin to purchasing an index fund of possible information markets. As a result, those who allocate resources to future information markets may have to face the vagaries of the random walk and consider its implications for funding decisions.

B. Beyond the Random Walk?

Given the disadvantages of a random walk in the origin of information markets, it seems worthwhile to consider if anything can be done about the random walk specifically and the more general issue of organization and advancement of the new field of information markets. Two main sources of organization present themselves: A private body or a government actor. We discuss what each possibility might accomplish and then evaluate its feasibility.

1. Private Organization: AIMing for the Future

What would be a private organization? Although in some sense almost every information market is private in the sense of being non-governmental, the type of organization here is more akin to a trade association like the National Association of Realtors or a self-regulatory organization such as the National Association of Securities Dealers. Call it the Association of Information Markets (AIM) for discussion purposes.

Could AIM solve the problems of the random walk? We suspect not, at least not totally. Membership would be voluntary, and the organization would lack any power to bar new entrants into the market.¹³¹ Accordingly, if an individual wished to open a new

¹³¹ This is necessarily true in light of the antitrust laws. *See generally* 15 U.S.C. § 1 (2000) (“Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce . . . is declared to be illegal”); 15 U.S.C. § 2 (2000)

information market, however random and idiosyncratic the endeavor might be, the organization would not interfere. Even if the organization somehow had the power to authorize or prohibit new markets (and it would not), exercising such power might be counterproductive. The organization might well have thoughtful views about what markets might be valuable, but intelligence is not infallibility, and the decisions about what markets might be successful or valuable might well be mistaken. Particularly with an emerging field that requires experimentation to develop the most successful methods, entrepreneurs need to be free to fail.

Nevertheless, the organization could help address the random walk by the organizing discussion of where information markets might be most useful and suggest the best areas for new markets. It might function as a type of peer review for entrepreneurial ideas in this area, and its endorsement of an area as appropriate for an information market could help potential market founders obtain from outside sources such as foundations or government grants. In this way, while not eliminating the vagaries of the random walk, AIM might help make the process of market creation less chaotic.

Beyond mitigating the random walk, such an organization could promote other common interests of the field of information markets. Examples of these common interests include many possibilities:

- attracting new participants to existing information markets,
- advertising the predictive efficacy of existing markets where possible,
- analyzing the reasons for any predictive failures to understand why they occurred,
- developing more accurate systems of information market design,

(“Every person who shall monopolize, or attempt to monopolize . . . shall be deemed

- facilitating academic research into information markets (potentially by publishing an annual journal),
- generally encouraging the expansion of information markets into new areas.

AIM might also help prevent misunderstandings about the nature of information markets. Part of the reason the DARPA's Policy Analysis Market failed was a congressional perception that the market would encourage people to profit by terrorist attacks.¹³² The reality was more complicated,¹³³ of course, and it might be helpful to have a voice for the information markets to be able to explain that they are not about encouraging illicit gambling or allowing terrorists to profit from their attacks.

Thus, while a private organization may not be able to remove all the negative consequences from a random walk, it could offer significant benefits for advancing the field of information markets.

1. Government organization

If the private sector cannot overcome the random walk, could a government do better? To be clear, we are not talking here about government regulation,¹³⁴ merely government sponsorship. Could the U.S. federal government create a blueprint for the development of information markets as part of some type of industrial policy?

guilty of a felony.”).

¹³² Hanson, *Impolite Innovation* at 3.

¹³³ *Id.* at 5.

¹³⁴ Government regulation of information markets is a fascinating subject, involving questions of international jurisdiction, traditional governmental authority in cyberspace, gaming law, analogies to constitutionally protected speech, and many more considerations. We will reserve this topic for a future article, however.

Certainly the government has assisted in developing information markets in areas of special interest to the government. The Policy Analysis Market, for example, was initially sponsored by DARPA before political controversy ended the project. And as discussed above, the use of information markets has significant potential for administrative agencies,¹³⁵ and government agencies might well advance the development of information markets in these areas.

But outside these areas of government interest, it seems questionable if the U.S. government will undertake substantial work with information markets. There are myriad groups lobbying for funding, no well-organized constituency exists to lobby on behalf of information markets, and to the extent that Congress remains aware of the technology, it may associate it with the controversial DARPA plan that had to be abandoned.¹³⁶ Furthermore, at least some information may be contrary to government interests – if they reveal government actions in advance or undercut the official position. It is quite easy to envision an information market reacting negatively to a politician’s speech, and if the market is funded by the government, this might create tensions, even if no government officials ever attempted to control the content of a market (an attempt that may not be inconceivable). More broadly, the prospect of government funding may place government officials in the role of trying to pick market winners and losers – a task that they may not wish to undertake.

¹³⁵ See generally Abramowicz, *Information Markets, Administrative Decisionmaking*, *supra* note [].

¹³⁶ Hanson noted that the PAM controversy has discouraged government agencies from pursuing information markets publicly. Telephone Interview with Robin D. Hanson, Associate Professor of Economics, George Mason University (Aug. 18, 2005).

In the end, supporters of information markets, like investors in stock markets, may be left with the vagaries of the random walk. Actions like forming an association to advance information markets can have value. Yet on balance, the wisest solution may be to stop wishing for more order and embrace the random messiness of markets – Michael Jackson pools and all.

APPENDIX A: CURRENT INFORMATION MARKETS

The following is a list of currently functioning information markets on the Internet, compiled from Internet searches. See also <http://www.informationfuturesmarkets.com/> <http://www.aei-brookings.org/pages/index.php?id=37> and Brendan I. Koerner, *What Weird Futures Can You Buy?: A Guide to Online Prediction Markets*, <http://slate.msn.com/id/2086316/>.

Austrian Political Stock Markets/Austrian Electronic Markets

<http://zwickl.ibab.tuwien.ac.at/apsm>

Information markets predicting outcomes of Austrian elections.

Blogshares

www.blogshares.com

Establishes a “fantasy stock market” for weblogs, web applications “which contain periodic, reverse chronologically ordered posts on a common web page” such as personal diaries, whereby players invest fictional money in shares of blogs, which are valued by the number of links. Participation is open to the general public.

Celebdaq

www.bbc.co.uk/celebdaq/

British trading market that values celebrities based on their current popularity. Participants use fictional money to buy and sell shares in celebrities. Dividends, based on the amount of press coverage, are paid weekly. Participation is open to the general public. When a participant's net worth tops £ 1,000,000, her shares are liquidated and she receives status symbol icons and £ 10,000 to continue future trading.

Election Stock Market

<http://esm.ubc.ca>

The general public can use real money to bid on the outcomes of Canadian elections.

Economic Derivatives

www.gs.com/econderivs/

Website launched by Goldman Sachs and Deutsche Bank allowing investors to use real money to purchase options on macro-economic events, such as retail sales, employment statistics, inflation and general economic growth.

Foresight Exchange

www.ideosphere.com

Allowing players to bid, using virtual money, on the outcomes of questions, such as whether Hillary Clinton will be elected president. Scores are tabulated based on the number of correct bids. Participation is open to the general public.

Hollywood Stock Exchange

<http://www.hsx.com/>

Participants buy and sell shares of actors and new movies using virtual money. Valuation is based on the success of the movie. Participation is open to the general public. Winnings can be exchanged for discounts on merchandise.

Influenza Prediction Market

http://iemweb.biz.uiowa.edu/OUTBREAK/flu_quotes.html

An invitation only market allowing Iowa medical professionals to buy and sell futures contracts to predict weekly influenza activity in Iowa. The market uses fake money, but winnings are converted to real money, which is paid as grants toward educational and professional expenses.

Innovation Futures

www.innovationfutures.com/bk/index.html

Players use virtual money to buy and sell contracts based on future prospects of technologies as well as business, economic, and financial trends. Participation is open to the general public. Merchandise prizes are awarded to contest winners.

InTrade

<http://www.intrade.com/>

The general public can invest real money to bid on the outcomes of various events ranging from the closing value of the Dow to December snowfall in Central Park to which Supreme Court Justice will be the next to leave the bench.

Iowa Electronic Markets (IEM)

<http://www.biz.uiowa.edu/iem/>

Best known for its presidential election market, IEM also has other political and economic markets in which members of the general public can invest real money. The IEM's earnings and returns markets are limited to academic traders.

Long Bets - Accountable Predictions

<http://www.longbets.org/>

Philanthropic project where a person can pay \$50 to make a prediction about something of social or scientific importance that will or will not happen at least 2 years in the future. Someone can turn the prediction into a bet by taking the other side (and paying more money). The money goes to the designated charity of the winner.

News Futures

www.us.newsutures.com/index.html

Players use virtual money to bid on the outcomes of news, financial, sports, and entertainment events. Participation is open to the public. Contests offer cash and merchandise prizes. Current contests involve pharmaceutical trends and 4th quarter drug sales.

Political Stock Exchange

<http://www.PoliticalStockExchange.com/>

Players use virtual money to purchase shares of politicians and political events. Participation is open to the general public. Prizes are offered for contests.

TradeSports

<http://www.tradesports.com/>

The general public can invest real money in futures contracts. Contracts are primarily for sporting events, but participants can also bid on politics, current events, and other topics.

Wahlstreet

<http://www.wahlstreet.de/>

Information market predicting outcomes of German elections.